

DATE: 1-10-20

SUBJECT: PHYSICS

## orthogonal Matrix.

1.  $|A| = \pm 1$

2.  $r_i r_j^T = 0$

3.  $A^{-1} = A^T$

الشعاع، والعمود، والمصفوفة

$$A^{-1} = \frac{1}{1} \begin{bmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{bmatrix} = A^T$$

## \* orthogonal transformation

$$P_{xyz} = R P_{ABC}$$

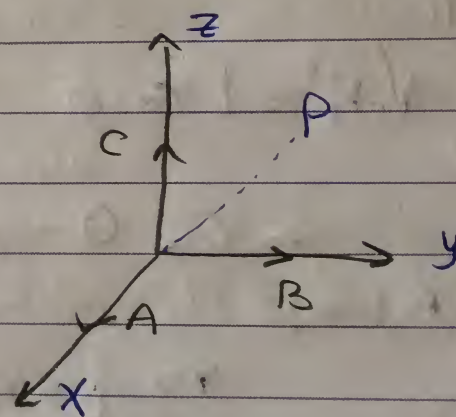
$$P_{ABC} = R^{-1} P_{xyz}$$

$$R(x, \theta) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \theta & -\sin \theta \\ 0 & \sin \theta & \cos \theta \end{bmatrix}$$

$$R^{-1}(x, \theta) = R^T(x, \theta) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \theta & \sin \theta \\ 0 & -\sin \theta & \cos \theta \end{bmatrix}$$

inverse  $\approx$  Transpose

يعني اننا نغير اشارة sine



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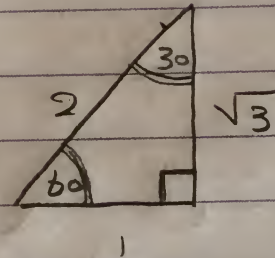
ex: 3.6. 45 <sup>slide.</sup> Composed. <sup>مركب</sup>

$$* R R^{-1} = R R^T = R^{-1} R = R^T R = I$$

$$A.I = I.A = A$$

PRE  $\xleftarrow{xyz} \boxed{I} \xrightarrow{ABC}$  POST

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\* base reference Fram  $\Rightarrow xyz$

الدراسة بنوع  $\theta = 0$  أي، في الموضع الأول  $\approx$  ان الموضع الثاني

end. 5.50

5.55

B<sub>1</sub>, A, OZ  $\oplus$   
 OX  $\ominus$  B<sub>2</sub>, C<sub>1</sub>  
 OY  $\uparrow$  B<sub>2</sub> B<sub>3</sub>

